

Remarks

Claims 1-32 were pending prior to the above amendments. Claims 2-4, 8, 18-20 and 24 are canceled. Claims 1, 5, 7, 9-12, 14, 17, 21, 23 and 25-29 are amended to more particularly point out and distinctly claim Applicants' invention. Claims 33-63 are newly presented. Therefore, Claims 1, 5-7, 9-17, 21-23 and 25- are pending.

Based on MPEP § 608.01, the Examiner objected to Applicants' Specification for references to hyperlinks to web pages. As amended, Applicants' Specification is believed in full compliance with the MPEP § 608.01.

The Examiner objected to Claims 1, 11-12 and 27-29 for antecedent bases. As amended, Applicants respectfully submit that the Examiner's objection is overcome.

The Examiner rejected Claims 1-3, 12-19 and 28-32 under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent Application Publication 20030142674 ("Casey"). With respect to independent Claim 1, the Examiner states:

6. As to Claim 1, Casey teaches the invention as claimed including: a method for providing, in a service provider's network, a multicast capability for a customer packet of a virtual private LAN service [e.g., paragraphs 20-22], comprising:

at a provider edge device associated with the virtual private LAN service [e.g., paragraph 21], encapsulating the customer packet of the virtual private LAN service in a service provider packet in accordance with a data communication protocol having a native multicast capability [e.g., Fig.2; paragraph 24] ;

transmitting over the service provider's network the service provider packet using the native multicast capability of the data communication protocol from the provider edge device to a plurality of other provider edge devices associated with the virtual private LAN service [e.g., Abstract; paragraph 51]; and

at each of the other provider edge devices associated with the virtual private LAN service, upon receiving the service provider packet, recovering the customer packet [Note that it is an inherent process to decapsulate a customer packet arriving at its destination provider edge].

Applicants respectfully traverse the Examiner's rejection. As amended, Claim 1 recites using the IP multicast routing protocol to deliver a customer packet encapsulated in a provider's network:

1. A method for providing, in a service provider's network, a multicast capability for a customer packet of a virtual private LAN service, comprising:

assigning the virtual private LAN service an Internet Protocol (IP) multicast group address in a private domain of the service provider's network;

at a provider edge device associated with the virtual private LAN service, encapsulating the customer packet of the virtual private LAN service in an IP packet designating the IP multicast group address;

transmitting the IP packet over the service provider's network using an IP multicast routing protocol from the provider edge device to a plurality of other provider edge devices associated with the virtual private LAN service; and

at each of the other provider edge devices associated with the virtual private LAN service, upon receiving the IP packet, recovering the customer packet.

As explained in Applicants' Specification, for example, at page 7, lines 8-21, Applicants' Claim 1 takes advantage of well-developed efficient IP multicast distribution algorithms. In contrast, contrary to the Examiner's contention, Casey neither discloses nor suggests Claim 1. Paragraph [0051] discloses using multicast destination address merely for the MAC or link protocol layer:

[0051] The other item associated with the VPLS Context is its Virtual Bridge (MAC) Multicast Destination Address, VBMcstDA. This is a MAC multicast address on the SET to be

used as the destination for Broadcast and Unknown customer Ethernet packets. All Edge-PEs in a SET use the same VBMcstDA for the same VPLS (this address could be derived algorithmically from the VBLabelPrefix, alternatively it could be just the MAC Broadcast address, since the broadcast or unknown packet will have the VBLabelPrefix for the VPLS set in its encapsulation). The choice of type of VBMcstDA address (multicast or broadcast) is an engineering issue, depending on the SET and Edge-PE hardware capabilities.

In fact, as discussed in Casey's paragraphs [0064] to [0080], on page 5, Casey discloses handling multicast/unknown packets by replicating the customer packet upon receiving into the provider's network:

[0064] When a customer packet arrives from edge (CE): ...

[0067] Examine Customer MAC destination address (DA) in relation to VB MAC learning table. ...

[0070] If found to be either a broadcast or unknown MAC packet then make copies for all other UNI ports in VB, plus encapsulate with base label (VBLabelPrefix plus all Os) and forward on SET with provider DA VBMcstDA. ...

[0075] The following section lists the operation of a Core-PE after provisioning, auto-discovery and signaling have established the SET to Core (S2C) and Core to SET (C2S) label mapping tables for a VPLS

[0076] When packet arrives from SET: ...

[0078] If broadcast/unknown (SET dest MAC address is multicast, lower order bits of SET Label is zero) then:

[0079] Identify the VPLS from the VBLabelPrefix

[0080] Step through all entries in the C2S with the same VBLabelPrefix, make a packet copy for each VC label and forward it over the associated transport LSP.

(emphasis added)

Unable to take advantage of the IP multicast routing protocol, unlike Applicants' Claim 1, Casey's approach, therefore, suffers from the "head-end replications" problem of the prior

art, which is discussed in Applicants' Specification, at page 3, lines 1-7. Therefore, Claims 1 and 12-16 are each allowable over Casey. Claim 17 – which similarly recites using IP multicast in the manner discussed above --- and its dependent Claims 28-32 are also each allowable over Casey. Reconsideration and allowance of Claims 1, 12-17 and 28-32 are therefore requested.

The Examiner rejected Claims 4-5, 7-8, 11, 20-21, 23-24 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Casey, and further in view of U.S. Patent Application Publication 20040165600 ("Lee"). However, as Claims 5, 7, 11, 21, 23 and 27, depend from independent Claims 1 and 17, respectively, for the reasons already discussed with respect to Claims 1 and 17 above, Claims 5, 7, 11, 21, 23 and 27 are each allowable over Casey. Since Lee also neither discloses nor suggests delivering customer packets using an IP multicast routing protocol, Claims 5, 7, 11, 21, 23 and 27 are each allowable over the combined teachings of Casey and Lee. Reconsideration and allowance of Claim 5, 7, 11, 21, 23 and 27 are therefore requested.

The Examiner rejected Claims 9-10 and 25-26 under 35 U.S.C. § 103(a) as being unpatentable over Casey, in view of Lee, and further in view of U.S. Patent Application Publication 20030026268¹ ("Navas"). Applicants respectfully traverse the Examiner's rejection. Claims 9-10 and 25-26 depend from Claims 1 and 17, respectively. Therefore, Claims 9-10 and 25-26 are allowable over the combined teachings of Casey and Lee for the reasons discussed above. As Navas also neither discloses nor suggests delivering customer packets using an IP multicast routing protocol in the provider's network, Claims 9-10 and 25-

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¹ In the Office Action, the Examiner refers to U.S. Patent Application Publication 20020026268. This reference appears to be incorrect, as that reference relates to a "Mechatronic Automotive System." Applicants assume that the Examiner has intended to refer U.S. Patent Application Publication 20030026268.

26 are allowable over the combined teachings of Casey, Lee and Navas. Reconsideration and allowance of Claim 9-10 and 25-26 are therefore requested.

For substantially the reasons stated above, newly presented Claims 33-63 are believed allowable.

Therefore, for the reasons set forth above, all pending claims (i.e., Claims 1, 5-7, 9-17, 21-23 and 25-63) are allowable over the art of record. If the Examiner has any question regarding the above, the Examiner is respectfully requested to telephone the undersigned Attorney for Applicant at 408-392-9250.

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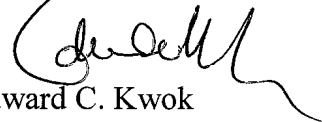


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